OBSERVATIONS AT HONOLULU.

Through the kind cooperation of Mr. Curtis J. Lyons, Meteorologist to the Government Survey, the monthly report of meteorological conditions at Honolulu is now made nearly in accordance with the new form, No. 1040, and the arrangement of the columns, therefore, differs from those previously published.

Meteorological observations at Honolulu, July, 1899.

The station is at 21° 18′ N., 157° 50′ W.
Pressure is corrected for temperature and reduced to sea level, and the gravity correction, —0.06, has been applied.
The average direction and force of the wind and the average cloudiness for the whole day are given unless they have varied more than usual, in which case the extremes are given. The scale of wind force is 0 to 12, or Beaufort scale. Two directions of wind, or values of wind force or amounts of cloudiness, connected by a dash, indicate change from one to the other.
The rainfall for twenty-four hours has always been measured at 7:30 p. m., not 1 p. m., Greenwich time, on the respective dates.
The rain gage, 8 inches in diameter, is 1 foot above ground. Thermometer, 9 feet above ground. Ground is 43 feet, and the barometer 50 feet above sea level.

Date.	Pressure at sea level.	Temperature.		During twenty-four hours preceding 1 p. m., Greenwich time, or 2:30 a. m., Honolulu time.									
				Temperature.		Means.		Wind.		Average cloudiness.	Sea-level pressures.		Total rainfall at 9 a. m., local time.
		Dry bulb.	Wet bulb.	Maximum.	Minimum.	Dew-point.	Relative humidity.	Prevailing direction.	Force.		Maximum.	Minimum.	
	*	†	†			‡	‡		§				
1	29.89	65	63	82	67	61.5	63	nne.	3-4	1	29.98	29.89	0.00
2	29.87	67	65	84	68	63.7	73	s-w-ne.	0-1	5	29.92	29.82	0.00
3	29.93	71	68	85	66	67.0	76	s-w-e.	0-1	1-9	29.96	29.88	0.00
4	29.98	74	67	84	68	65.7	68	ne.	3	1-3	29.99	29.93	0.00
5	29.93	74	66	82	74	65.5	71	ne.	3	4-8	30.03	29.93	0.10
6	29.90	72	65.5	81	70	63.7	66	ne.	3	5	29.98	29.90	0.04
7	29.92	74	65.5	82	70	62.0	63	nne.	3	2-4	29.95	29.88	0.01
8	29.98	75	68	83	73	61.7	60	ene.	3	3	30.01	29.91	0.01
9	30.01	75	69.5	84	73	64.2	65	ne.	3	7-3	30.06	29.97	0.05
01	29.99	75	69	82	72	66.5	69	ene.	3-5	8	30.05	29.99	0.00
11	30.00	73	69.5	84	75	66.2	68	ene.	3	7	30.06	29.98	0.01
12	29.95	73	66	83	71	64.2	67	nne.	3	2	30.03	29.95	0.05
13	29.97	67	63	85	65	61.2	60	e-n.	1	3	29.99	29.91	0.00
14	29.98	67	64	84	65	63.7	67	sw.	1	4	30.01	29.95	0.00
15	29.96	74	70.5	87	66	65.2	69	s-ne.	0-2	0-6	30.01	29.93	0.00
16	29.97	74	69.5	87	74	70.2	76	ne.	2	7-2	30.01	29.92	0.00
17	30.00	77	70	86	70	67.7	64	ne.	3	3	30.03	29.94	0.00
18	30.01	76	67.5	86	77	66.5	66	nne.	1-3	7-2	30.06	30.00	0.00
19	29.99	76	67	85	75	62.3	58	ne.	2-4	4-8	30.08	29.99	0.00
20	30.00	74	67	84	75	63.5	64	ene.	3	6	30.06	29.98	0.00
21	29.97	72	67.5	83	74	64.3	66	ene.	3	5	30.05	29.96	0.06
22	29.96	75	68	83	71	64.5	70	ene.	3-5	4	30.02	29.91	0.01
23	29.96	75	67.5	84	74	63.3	62	ene.	3	3	30.00	29.92	0.03
24	29.94	74	68.5	82	73	63.5	65	ne.	3	4	30.00	29.92	0.00
25	29.90	72	68.5	85	73	65.0	65	nne.	2	2-6	29.97	29.90	0.02
26	29.91	74	70	85	71	67.5	71	ne.	3	6	29.92	29.85	0.00
27	29.93	75	69	87	71	67.5	69	ne.	2	4-1	29.97	29.90	0.00
28	29.98	76	69	86	74	68.5	70	ene.	3	5	30.03	29.98	0.02
29	29.97	75	68.5	84	75	65.0	63	ne.	2-4	3-1	30.03	29.95	0.00
30	29.95	75	68.5	84	74	65.7	67	nne.	3	2-5	30.02	29.92	0.00
31	29.96	74	67	84	74	65.3	65	ne.	3	6	30.00	29.92	0.01
Sums.	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	0.42
Means.	29.96	73.2	67.5	84.1	71.7	64.9	66.6	.....	.....	4.2	30.009	29.927	.....
Departure.	—.015	.....	.....	.....	.....	.....	—3.0	.....	0.0	0.0	.....	.....	—1.60

Meteorological observations at Honolulu, August, 1899.

	*	†	†			‡	‡		§				
1	30.00	75	69	85	73	64.5	64	ne.	3	4	30.04	29.94	0.08
2	29.96	75	72	85	71	67.5	71	ne.	4-0	2-5	30.01	29.96	0.11
3	29.94	76	70	86	72	70.3	76	ne.	2-4	4-2	30.00	29.92	0.19
4	29.93	75	69.5	84	73	67.3	71	ne.	3	4-2	29.98	29.91	0.00
5	29.92	76	68	85	74	67.3	69	ene.	3	5-8	29.96	29.89	0.01
6	29.96	75	68	85	76	66.0	66	ene.	3	7	30.00	29.92	0.00
7	30.01	76	70	85	75	64.0	62	ne.	4	7-2	30.04	29.98	0.00
8	29.99	75	68.5	82	75	69.2	76	ene.	1-3	9-4	30.04	29.96	0.28
9	29.98	75	68	84	75	65.2	64	ne.	2-5	2	30.03	29.93	0.01
10	29.94	75	67.5	82	74	67.7	78	ne-nne.	3-5	6	30.00	29.92	0.08
11	29.94	74	68	83	72	64.5	64	ene.	4	4-8	29.99	29.94	0.10
12	29.95	75	68.5	84	71	66.0	68	nne.	3-1	5	30.01	29.94	0.06
13	29.96	75	67	84	74	65.7	67	ne.	3-5	4	30.02	29.95	0.03
14	29.96	75	68	84	75	64.8	63	ne.	4	5	30.01	29.95	0.07
15	29.96	74	69	83	73	64.7	65	ne.	4	6	30.01	29.94	0.20
16	30.00	74	69	83	71	65.7	69	ne.	4	4-8	30.02	29.94	0.14
17	29.96	75	67.5	83	72	66.3	72	ene.	5	8	30.05	29.96	0.02
18	29.93	75	67.5	84	74	64.7	63	nne.	5	4	30.00	29.92	0.00
19	29.94	75	67	84	74	64.5	63	nne.	5	2	29.99	29.91	0.00
20	29.96	71	66	84	75	64.0	62	nne.	4	2	29.99	29.90	0.00
21	29.95	75	69	85	70	63.7	64	nne.	3	4-1-5	29.99	29.90	0.01
22	29.94	74	68.5	84	75	67.7	73	ne-e.	3	9	29.98	29.91	0.06
23	29.93	74	66.5	83	74	67.0	76	ene.	4	9-7	29.98	29.91	0.02
24	29.94	74	67	83	74	62.7	61	nne.	3	4	29.99	29.90	0.00
25	29.97	75	66.5	84	73	63.3	61	ne.	4	3	30.00	29.94	0.01
26	29.98	74	68.5	83	74	63.5	62	ne.	4-5	4	30.01	29.94	0.09
27	29.96	74	67	83	73	65.3	68	ene.	3	7-3	30.04	29.95	0.01

Meteorological observations at Honolulu, August, 1899—Continued.

Date.	Pressure at sea level.	Temperature.		During twenty-four hours preceding 1 p. m. Greenwich time, or 2:30 a. m., Honolulu time.									
				Temperature.		Means.		Wind.		Average cloudiness.	Sea-level pressures.		Total rainfall at 9 a. m., local time.
		Dry bulb.	Wet bulb.	Maximum.	Minimum.	Dew-point.	Relative humidity.	Prevailing direction.	Force.		Maximum.	Minimum.	
	°	†	†			‡‡	‡‡		•				
28	29.90	68	64.5	85	74	63.7	63	ne.	3-0	3-1	29.98	29.88	0.00
29	29.89	70	66.5	86	67	64.0	66	nne.	2-0	1	29.92	29.79	0.00
30	29.94	74	69.5	86	68	66.7	71	s-nne.	0-3	6-1	29.96	29.85	0.00
31	30.00	76	68.5	85	72	67.0	69	ene.	3	3	30.04	29.94	0.00
Sums.	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	1.53
Means.	29.96	74.3	68.1	84.0	73.0	65.6	67.3	.....	3.3	4.5	30.00	29.92	....
Departure.	—0.01	.....	.....	—0.3	—0.3	.....	—1.3	.....	.....	+0.5	.....	.....	—0.50

Mean temperature for July, 1899 (6+2+9)÷3=77.0°; normal is 77.3°. Mean pressure for July (9+3)÷2 is 29.970; normal is 29.995.
• This pressure is as recorded at 1 p. m., Greenwich time. † These temperatures are observed at 6 a. m., local, or 4:30 p. m., Greenwich time. ‡ These values are the means of (6+9+2+9)÷4. § Beaufort scale.

Mean temperature for August, 1899, (6+2+9)÷3=77.3°; normal is 77.6°. Mean pressure for August (9+3)÷2 is 29.96; normal, 29.98.
• This pressure is as recorded at 1 p. m., Greenwich time. † These temperatures are observed at 6 a. m., local, or 4:30 p. m., Greenwich time. ‡ These values are the means of (6+9+2+9)÷4. § Beaufort scale.
On the 24th earthquakes reported at Hilo, Hawaii, and Tanoke, over Mauna Loa.

AUTOMATIC RECORDS OF A THUNDERSTORM.

By H. H. KIMBALL, Weather Bureau.

On the afternoon of August 2, 1899, a severe thunderstorm, accompanied by destructive winds and hail, passed over the District of Columbia and the adjacent counties of Maryland. The center of its path, and also the region experiencing the greatest destructive effect, were a few miles to the east of Washington. The Central Office of the Weather Bureau did not, therefore, feel the full force of the storm; but the records obtained from some of the automatically recording instruments in operation in the Instrument Division are believed to be of sufficient interest to warrant their reproduction.

All recording instruments employed by the Weather Bureau are furnished with pens in which a purple aniline ink is used. This color prevents the direct reproduction of records by photographic processes. Blank record sheets were, therefore, superimposed over the sheets containing the instrumental records of this storm, and the records were traced in by hand with india ink. Full size photo-engravings of these traced records were then obtained, from which the diagrams on Fig. 1, page 357, were printed.

Full descriptions of most of the instruments employed may be found in Circulars D, E, F, and G, Instrument Division, and also in Part I, Report of the Chief of the Weather Bureau, 1891–1892.

The following brief description of the records, and the manner in which they are obtained, is for the benefit of those not familiar with the instrumental equipment of Weather Bureau stations.

On Fig. 1 the record marked *A* is from the so-called quadruple register, sometimes called the triple register, in general use at stations. The record is in four parts designated *a*, *b*, *c*, and *d*.

The part of *A*, designated *a*, represents the direction from which the wind was blowing, and is obtained by means of four automatic circuit closers attached to a rod that turns with the wind vane. A "minute contact" on the register clock completes the circuit through the proper magnet or magnets, and the corresponding direction is marked on the record sheet by printing arms attached to the magnet armatures.